DREAM
Danish Research Institute for
Economic Analysis and Modelling

MAKRO

The Macroeconomic Role of Labor Immigration

Martin Kirk Bonde

Shock analysis
19 November 2026

www.dreamgruppen.dk

1 Introduction

This report uses MAKRO to quantify the macroeconomic role of labor immigration in Denmark. It compares the baseline projection, where labor immigration follows its projected path, with a stylized counterfactual where no new labor-permit immigrants arrive from 2027 onward. Reported effects are differences between the two scenarios and measure the contribution of labor immigration to the baseline.

The counterfactual is deliberately extreme. It is not a forecast or an evaluation of a concrete policy package. Its purpose is to isolate a channel that is otherwise gradual and largely hidden inside the baseline. Labor immigration affects the size and composition of the population, the labor force, public expenditure needs, domestic demand, and Denmark's interaction with the rest of the world.

Labor immigration is defined by residence basis: the residence permit is tied to work, unlike permits granted for education, asylum, family reunification, Nordic citizenship, or other grounds. This distinction matters because work-related immigrants are concentrated in working ages and have much stronger labor-market attachment than other immigrant groups.

The scenario is constructed outside MAKRO in two steps. First, the underlying population projection is recomputed in DREAM's demographic forecasting model, which is used for official Danish population projections. Second, the new population path is passed through DREAM's socioeconomic forecast model and model for demographic demand for government consumption. These outputs then enter MAKRO directly. In model terms, the shocks are revised paths for population by age and socioeconomic group, together with derived paths for government consumption needs, labor-market participation, hours, and productivity profiles.

2 Counterfactual Scenario

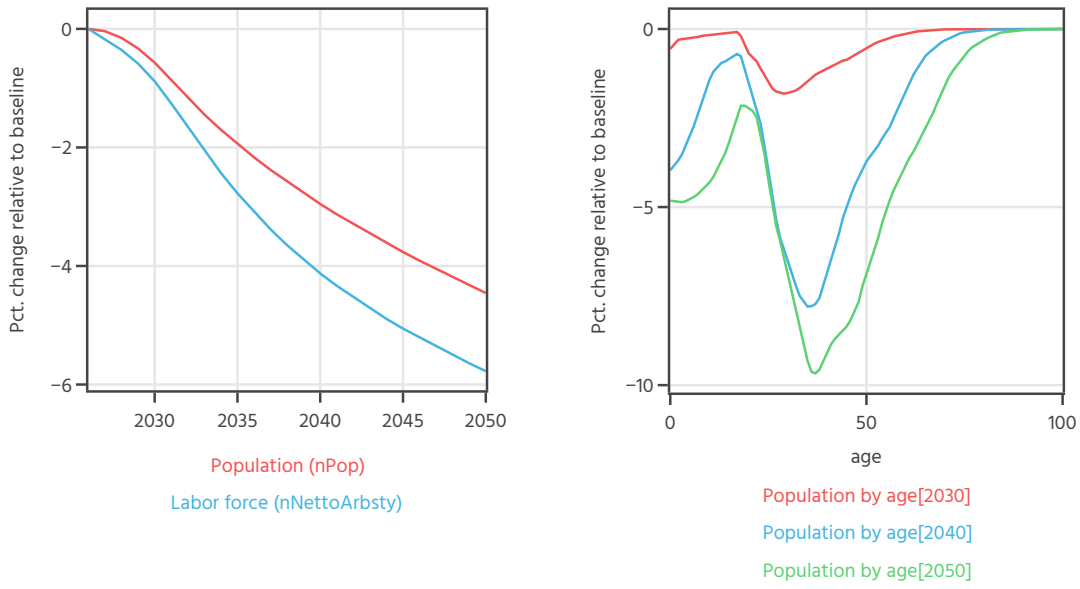
2.1 Population scenario

The immediate demographic effect is a lower population path that widens as the missing inflows accumulate. The scenario also removes indirect effects, especially accompanying and subsequent family members and their future demographic behavior.

The population effect is therefore broader than the missing workers themselves. Lower labor immigration reduces the stock of resident immigrants, reduces births, and shapes later outcomes for descendants. Over long horizons, these generational effects can even affect the number of persons classified as being of Danish origin, since the children of descendants may enter that category in the projection. Figure 2.1 shows the pattern: the initial change is concentrated among working-age adults, but over time the decline spreads to children and retirees.

Because labor immigrants cluster in working ages, the labor force contracts more than the total population. This asymmetry is central to the transmission. A smaller population dampens demand for housing, private consumption, and public services. A smaller labor force lowers production capacity, raises wage and price pressure, and shifts the fiscal balance.

Figure 2.1
Population and labor force



Note: The figure shows the effect of a counterfactual with no new labor-permit immigration from 2027 onward, measured relative to the baseline with projected labor immigration. The left panel shows percentage changes in the total population and labor force. The right panel shows the percentage change in the population by age in selected years.
Source: Own calculations using the DREAM population and socioeconomic models and MAKRO.

2.2 Implementation in MAKRO

The MAKRO simulation starts from the baseline and applies the differences between the counterfactual and baseline versions of the upstream population and socioeconomic projections on the relevant exogenous paths.

The direct inputs are:

- Population by age.
- The distribution of the population across socioeconomic groups.
- Structural labor supply and labor-market participation by age.
- Age-specific working hours and labor productivity.

- The demographic pull on individual government consumption.

Public production responds through the demographic-pull mechanism, so public employment, procurement, and capital services adjust to lower demand for public services from a smaller and differently composed population.

The socioeconomic input matters because labor immigrants are not treated as an average immigrant group. Their high participation reflects the work basis of their residence permit. Working hours and productivity are not separate behavioral assumptions in MAKRO; they enter through the age, socioeconomic, and productivity profiles delivered by the upstream projection models.

MAKRO does not model the migration decision itself. It traces the macroeconomic consequences of receiving a different demographic and socioeconomic projection.

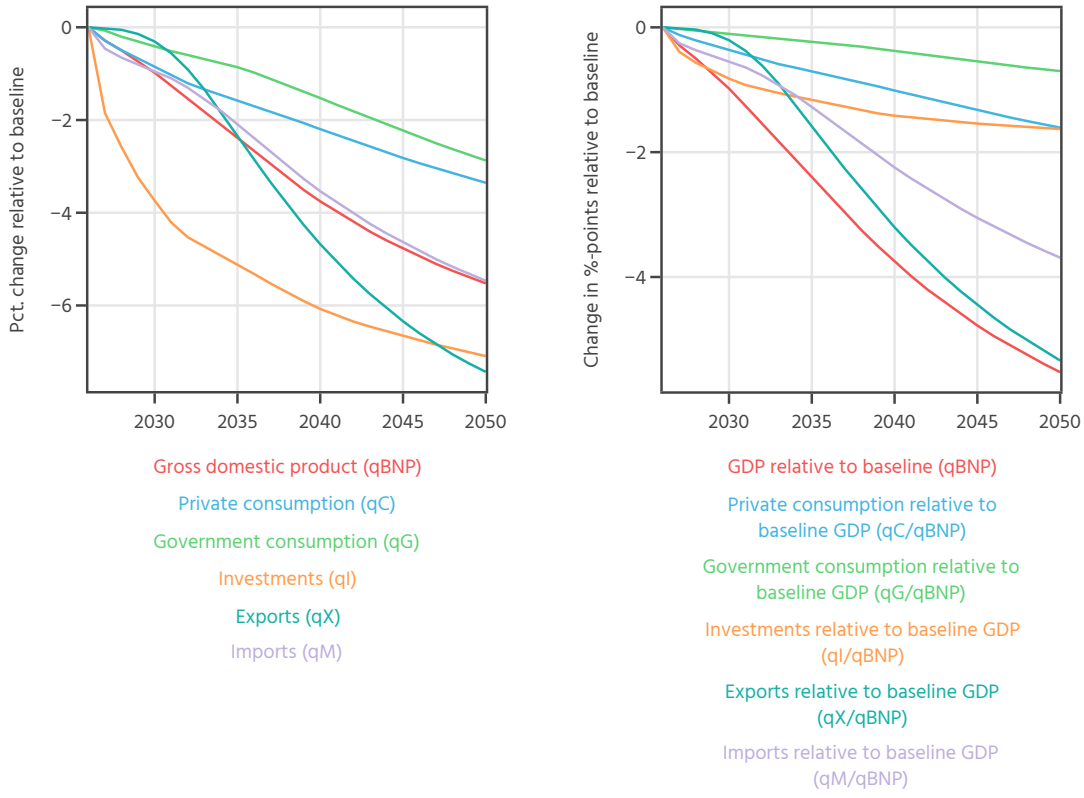
3 Aggregate Role in the Economy

3.1 Output and Demand

The counterfactual shows that labor immigration supports a materially larger baseline economy. Without new labor-permit immigration, GDP is lower because the labor force and effective labor input are smaller. Private consumption, government consumption, investment, exports, and imports all fall relative to the baseline, each through a distinct channel.

Private consumption falls mainly because there are fewer households and weaker housing demand lowers house prices, liquidity, and housing wealth. Business investment falls as lower production reduces the aggregate need for capital. Housing investment also falls, but less than capital in other industries. Housing is constrained by land and building rights, which is one reason house prices tend to grow faster than consumer prices in the long run. When population growth weakens, this scarcity pressure eases, housing becomes cheaper relative to other consumption goods, and households substitute toward housing services. Exports decline because higher domestic costs weaken price competitiveness and because a smaller economy supports fewer firms and product varieties in the long run. MAKRO captures this scale effect through private structural value added, which is a reduced-form for the underlying variety channel. Imports fall mainly because domestic demand and production are lower. Figure 3.1 summarizes how these channels add up across aggregate demand and supply.

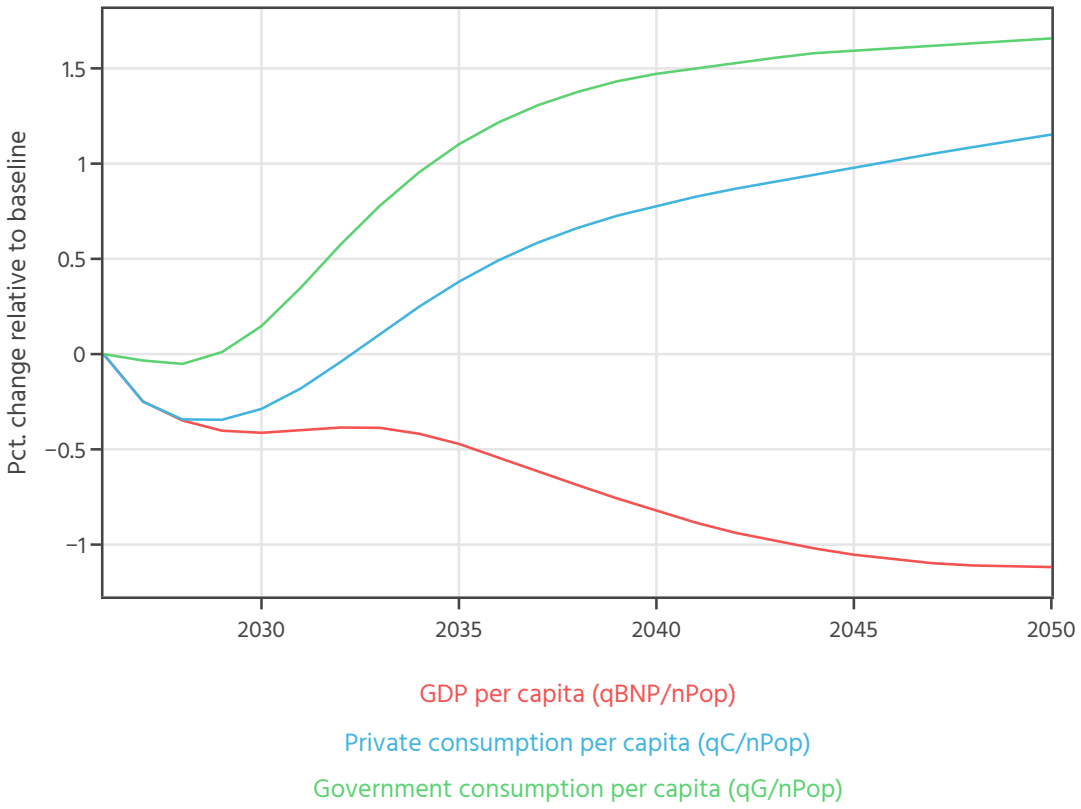
Figure 3.1
Aggregate output and the supply balance



Note: The figure shows the effect of a counterfactual with no new labor-permit immigration from 2027 onward, measured relative to the baseline with projected labor immigration. The left panel shows percentage changes in real aggregates. The right panel decomposes changes in real supply-balance components as percentage points of baseline GDP.
Source: Own calculations using MAKRO.

Aggregate GDP falls substantially, but GDP per capita is the more relevant gauge of average economic resources available to the remaining population. The per-capita effect is smaller because both GDP and population decline. The outcome reflects several offsetting mechanisms. Scarcer labor raises wages for workers who remain in Denmark and induces some substitution toward capital. Weaker housing demand depresses house prices, liquidity, and housing wealth. The deteriorating public balance reduces fiscal room for maneuver, although the simulation does not close it through an automatic tax or transfer response. The long-run per-capita effect is therefore not a pure productivity story; it reflects the interaction of labor supply, capital adjustment, public finances, exports, and housing.

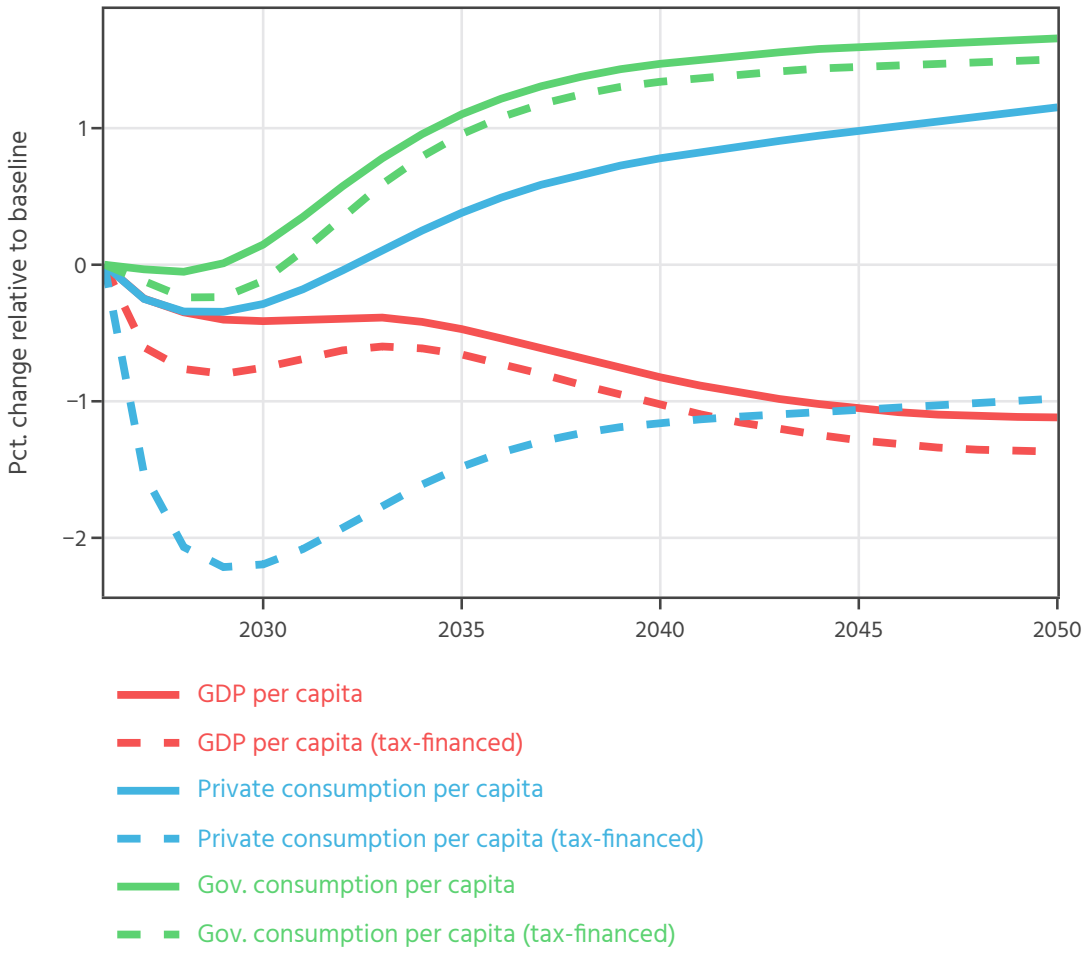
Figure 3.2
GDP, private consumption, and government consumption per capita



Note: The figure shows the effect of a counterfactual with no new labor-permit immigration from 2027 onward, measured relative to the baseline with projected labor immigration. Per-capita measures are computed as real aggregates divided by the total population.
Source: Own calculations using MAKRO.

The unfinanced scenario shows per-capita gains from scarcer labor and higher wages. However, the deteriorating fiscal position implies that taxes must eventually rise to restore sustainability. Figure 3.3 compares the unfinanced per-capita outcomes with a tax-financed version in which a lump-sum tax closes the fiscal gap. Under financing, private consumption per capita turns negative, while public consumption per capita is largely unaffected.

Figure 3.3
Per-capita effects: unfinanced vs. tax-financed



Note: The figure shows the effect of a counterfactual with no new labor-permit immigration from 2027 onward, measured relative to the baseline with projected labor immigration. Solid lines show the unfinanced scenario. Dashed lines show the same scenario with lump-sum tax financing that restores fiscal sustainability.
Source: Own calculations using MAKRO.

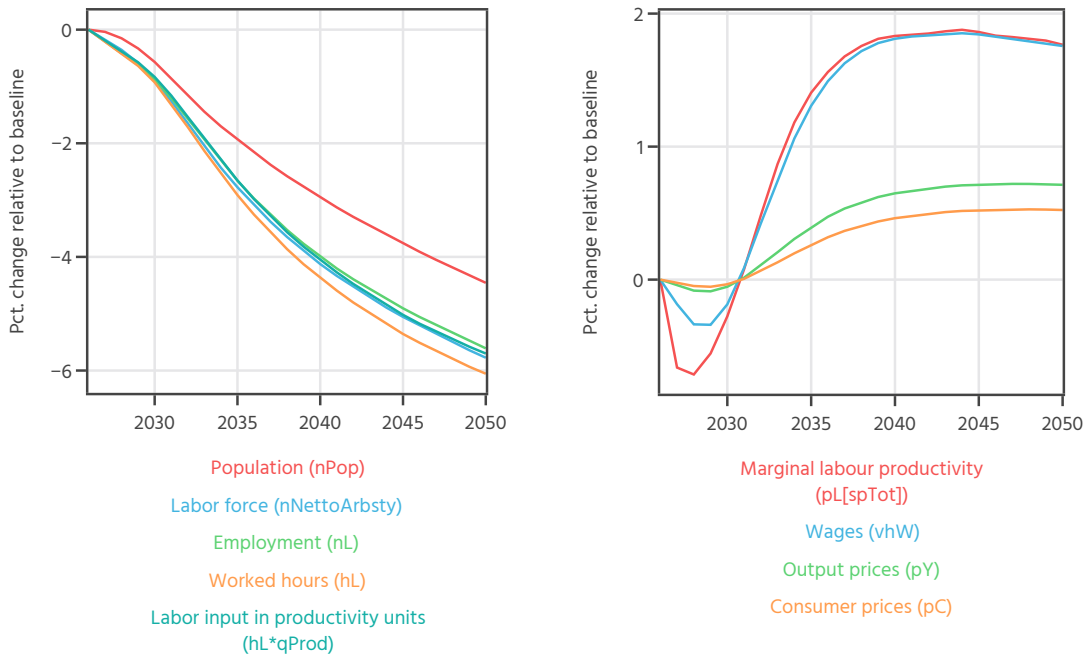
3.2 Employment, Wages, and Prices

The labor-market contribution is structural and immediate: the projected labor force is higher in the baseline than in the counterfactual. Actual employment follows through model dynamics as wages, prices, capital, and sectoral demand adjust. This is why labor immigration has a larger macroeconomic effect than its population share alone suggests. Labor immigrants enter the projection at ages with high participation, while the population average also includes children, students, retirees, and others outside employment. The baseline therefore contains both more people and disproportionately more effective labor input.

The reduction in labor supply pushes wages above baseline. In MAKRO's search-and-match labor market, tighter conditions raise the marginal cost of hiring and strengthen wage pressure, with wages adjusting gradually. Higher labor costs raise firms' unit costs and, through sluggish price setting and the input-output system, feed into domestic output and demand prices. The wage increase is therefore not only distributional; it also works as an open-economy cost channel by weakening exports.

Figure 3.4

Labor market, wages, and prices



Note: The figure shows the effect of a counterfactual with no new labor-permit immigration from 2027 onward, measured relative to the baseline with projected labor immigration. The left panel compares population, labor force, employment, worked hours, and labor input measured in productivity units. The right panel shows nominal wage, productivity, and price responses.
Source: Own calculations using MAKRO.

Figure 3.4 illustrates why labor immigration contributes mainly through effective labor supply rather than population alone: the labor-input response is larger than the demographic response.

Real wages rise because labor becomes scarcer in an unfinanced negative labor-supply shock. Firms also use relatively more capital per worker, so the aggregate capital response is not proportional to employment. Price effects remain important for trade: higher domestic costs reduce price-sensitive export demand.

Figure 3.5
Real wages and prices



Note: The figure shows the effect of a counterfactual with no new labor-permit immigration from 2027 onward, measured relative to the baseline with projected labor immigration. The left panel compares real wages, average hourly wages, consumer prices, and marginal labor productivity. The right panel shows selected aggregate price indices.
Source: Own calculations using MAKRO.

4 Domestic Channels

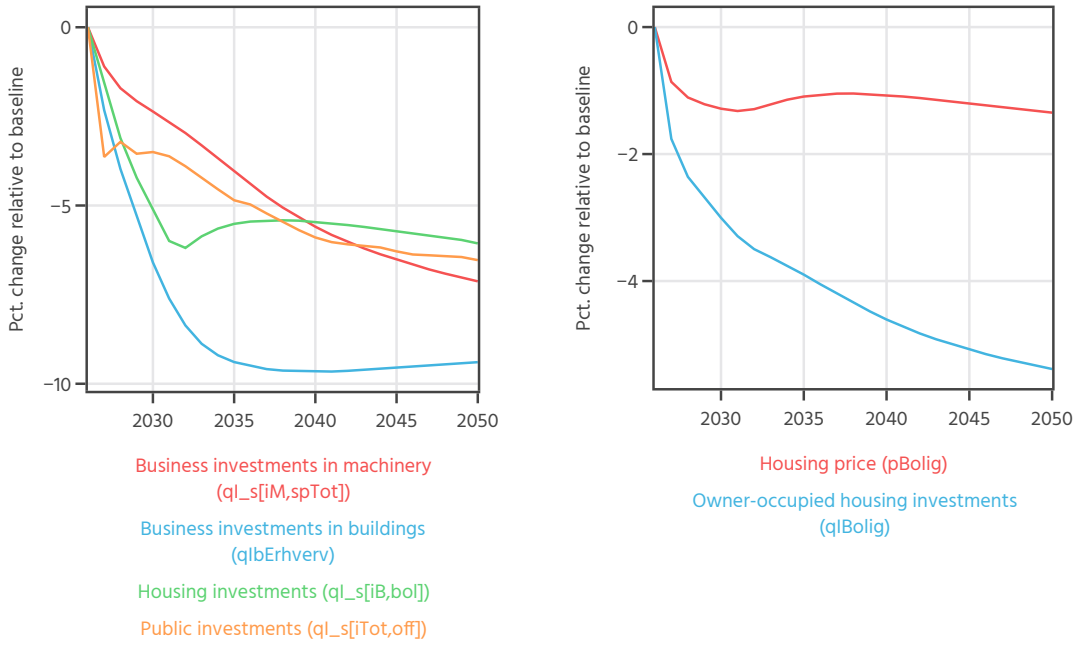
4.1 Capital, Housing, and Consumption

A smaller labor force lowers production and the desired private capital stock. At the same time, higher real wages make capital relatively cheaper than labor and induce substitution toward capital. This production-side substitution partly dampens the fall in business capital, but the housing-market channel is more important for the difference between housing investment and other investment.

The housing market moves through a separate demand channel. A lower population path reduces demand for dwellings, depressing house prices and housing investment. Because land and building rights constrain housing supply, weaker demand also reduces the relative price of housing services and induces substitution toward them. Lower house prices erode household

wealth and feed back into private consumption. This channel is especially important during the transition because the housing stock adjusts slowly.

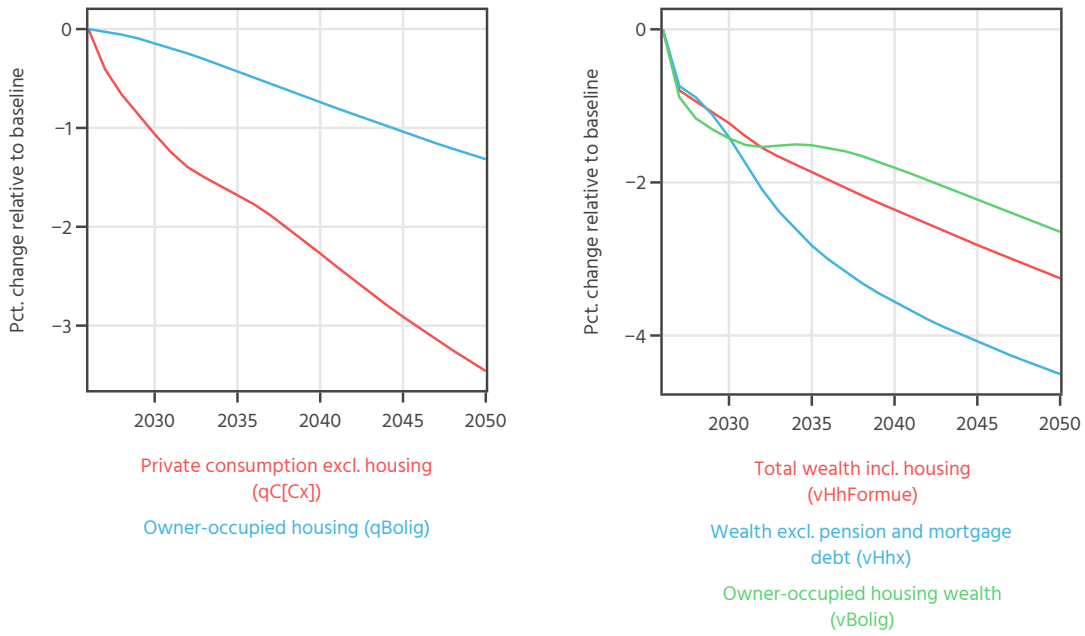
Figure 4.1
Investment and the housing market



Note: The figure shows the effect of a counterfactual with no new labor-permit immigration from 2027 onward, measured relative to the baseline with projected labor immigration. The left panel shows investment volumes by type. The right panel shows the response of house prices and housing investment.
Source: Own calculations using MAKRO.

Private consumption responds to both population and income. Aggregate consumption falls because there are fewer residents. Per-capita consumption reflects higher wages, changes in employment composition, and the housing-market channel through wealth and liquidity. The weaker public-finance position appears in the budget and fiscal sustainability indicator, but this unfinanced simulation does not impose an automatic financing shock on households.

Figure 4.2
Household consumption and wealth



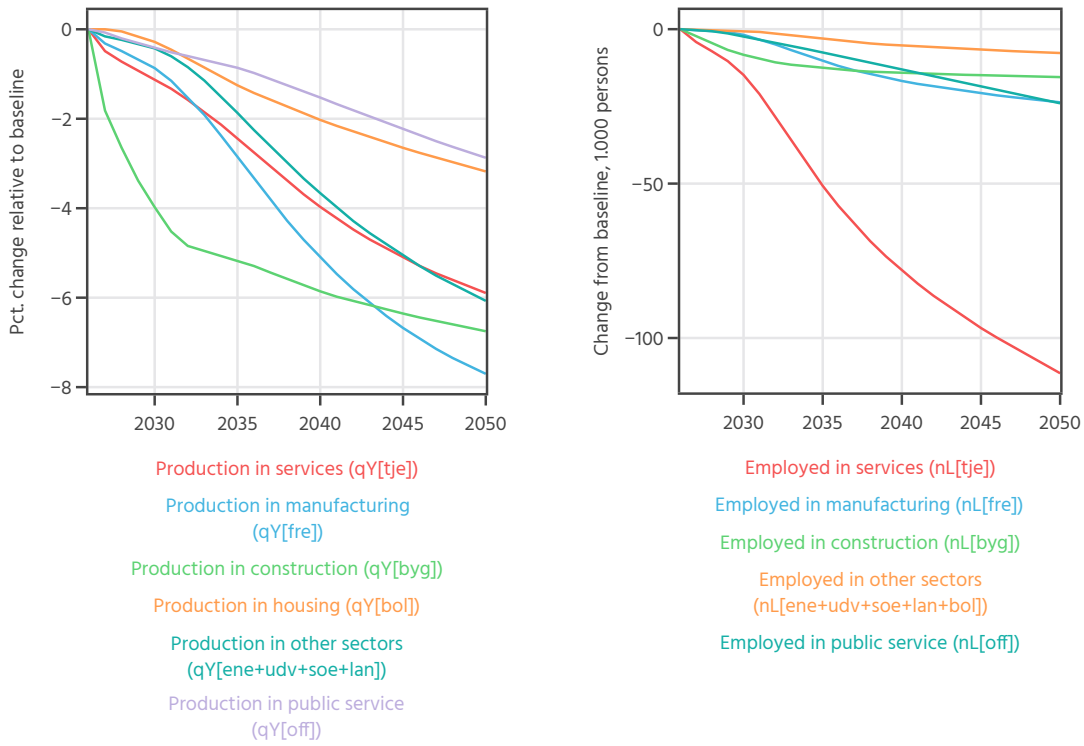
Note: The figure shows the effect of a counterfactual with no new labor-permit immigration from 2027 onward, measured relative to the baseline with projected labor immigration. The left panel shows private consumption excluding housing and owner-occupied housing services. The right panel shows selected measures of household wealth.
Source: Own calculations using MAKRO.

4.2 Sectoral Composition

The role of labor immigration varies across sectors. Activities tied closely to domestic demand, including household services, public services, and construction, are supported in the baseline by the higher population path and stronger housing investment. Export-oriented sectors are affected mainly through capacity and competitiveness. Capital-intensive sectors tend to be less affected in employment terms than labor-intensive sectors.

Labor is treated as homogeneous across sectors in the model: we do not distinguish industries that rely more heavily on immigrant labor from those that do not. In practice, certain sectors have a higher share of immigrant workers and may face specific recruitment bottlenecks or specialization constraints. These sector-specific labor-market frictions are not modelled.

Figure 4.3
Production and employment by sector



Note: The figure shows the effect of a counterfactual with no new labor-permit immigration from 2027 onward, measured relative to the baseline with projected labor immigration. The panels decompose changes in production and employment across broad sectors.
Source: Own calculations using MAKRO.

Figure 4.3 shows that the contraction is not uniform across sectors. The output and employment responses differ because sectors vary in labor intensity, capital intensity, and exposure to domestic demand.

5 Public Finances

5.1 Budget Effects

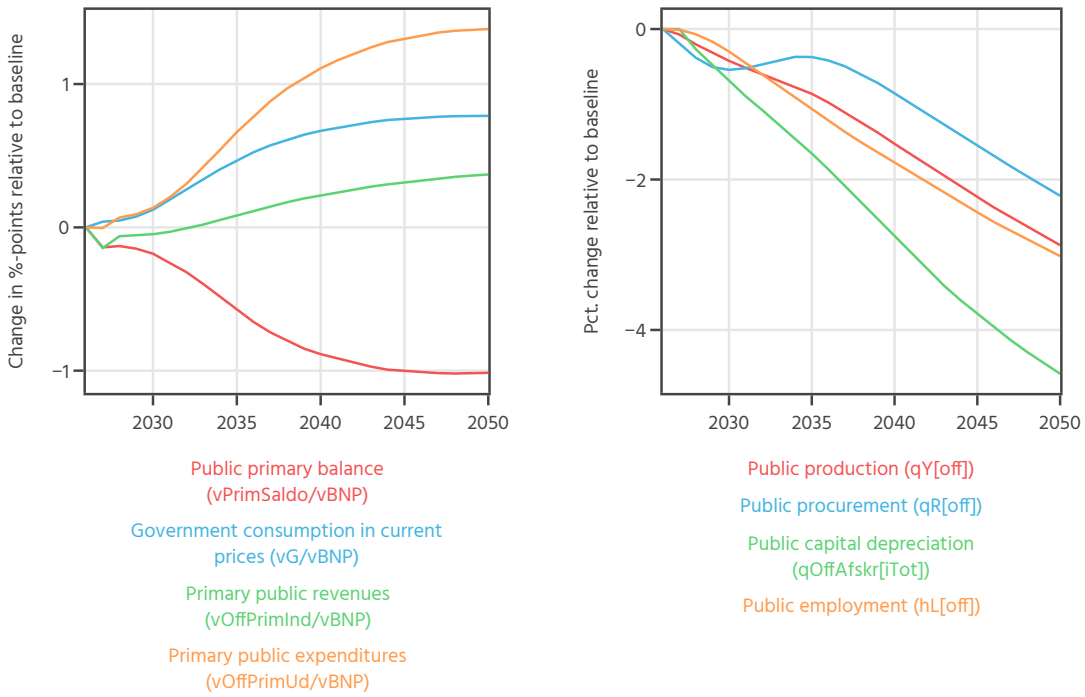
Labor immigration affects both sides of the public budget. In the counterfactual, revenues fall because the tax bases shrink: there are fewer workers, lower aggregate income, lower consumption, and lower production. Public expenditure also falls because the population is smaller and individual government consumption follows the demographic-pull mechanism.

The net effect is not neutral. Labor immigrants arrive as working-age adults with relatively strong labor-market attachment. Removing them removes tax contributors whose public expenditure needs are limited in the first decades after arrival. Age-related expenditure on health care, eldercare, education, and transfers adjusts to the new population composition, but the savings do not fully offset the lost revenue. The public balance therefore deteriorates relative to the baseline.

The fiscal sustainability indicator (HBI) summarizes whether the present value of future primary balances, together with initial net government savings, covers future government obligations. A deterioration means the primary balance must improve permanently, or taxes must rise, to satisfy the intertemporal government budget constraint. The fiscal sustainability indicator deteriorates by 0.78 percentage points of GDP in 2026, reflecting the net fiscal contribution of the projected labor immigration. This is equivalent to 24bn DKK pr. year in 2026 levels.

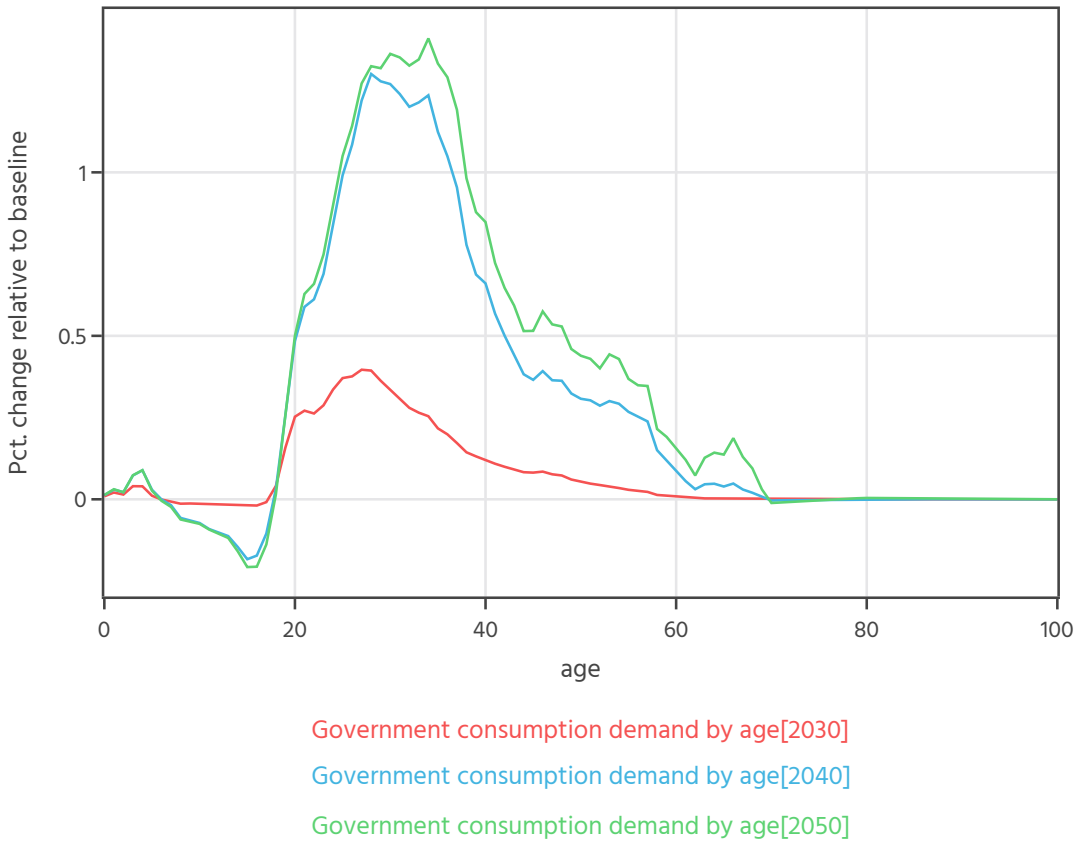
Public production adjusts downward as demographic demand for public services falls. Public employment, procurement, and capital services all decline relative to the baseline. The adjustment is not proportional to total population: the age composition of the missing population matters for education, health care, eldercare, and other individual public services.

Figure 5.1
Public budget and public production



Note: The figure shows the effect of a counterfactual with no new labor-permit immigration from 2027 onward, measured relative to the baseline with projected labor immigration. The left panel shows changes in public budget items as percentage points of GDP. The right panel shows how public production and its main inputs adjust to lower demographic demand.
Source: Own calculations using MAKRO.

Figure 5.2
Demographic pull on government consumption per person by age



Note: The figure shows the effect of a counterfactual with no new labor-permit immigration from 2027 onward, measured relative to the baseline with projected labor immigration. Age profiles show the change in the *per-person* demographic pull on individual government consumption in selected years. The differences arise from changes in the composition of the population by gender and origin (immigrant, descendant, native). Note that the upstream projection assigns labor immigrants the same age- and origin-specific needs as other residents; any differences in actual service usage are not captured.
Source: Own calculations using the DREAM population and socioeconomic models.

6 Interpretation and Limitations

The counterfactual isolates a single channel by imposing a complete halt to labor-permit immigration. This makes the results easy to interpret, but more stylized than any realistic policy experiment. The analysis does not model substitution between migration categories, behavioral responses by firms or migrants, or shifts in residents' education and occupational choices.

Within MAKRO, immigrants and native Danes differ only through variables delivered by the upstream projection models: age, socioeconomic status, participation rates, hours, productivity,

and transfer status. Individual government consumption is assigned through the demographic demand model by age and socioeconomic group, while collective government consumption scales with population. The model does not assign separate preferences, savings behavior, consumption patterns, or broader social effects to immigrants relative to native Danes.

The trade effects should likewise be read as macroeconomic equilibrium effects, not estimates of firm-level behavior. Exports respond because domestic costs and relative prices change, and because MAKRO links long-run export capacity to private structural value added through a scale effect. Imports respond because domestic demand and production change, with import shares adjusting gradually to relative prices. The simulation describes how labor immigration affects the open-economy equilibrium of a small economy, not how individual exporters or importers adjust their market strategies.

More broadly, the analysis is limited to the economic channels represented in the macroeconomic model. It does not capture effects on societal cohesion, integration outcomes, or associated social dynamics such as pressures on housing in specific areas, law and order, or other externalities that may accompany immigration. These channels may be relevant for a complete policy assessment but lie outside the scope of a macroeconomic projection model.

7 Conclusion

The counterfactual confirms that projected labor immigration plays a substantial role in the baseline Danish economy as represented in MAKRO. Without new labor-permit immigration from 2027 onward, the labor force is smaller and the aggregate capital stock adjusts downward, despite some substitution toward capital. GDP, consumption, investment, exports, and imports all fall relative to the baseline.

Labor immigration also supports public finances in the baseline. In the counterfactual, lower expenditure on a smaller population does not fully offset the lost tax revenue from working-age immigrants. The result is a weaker public-finance position and a deterioration of fiscal sustainability.

In the unfinanced scenario, both private and government consumption per capita increase when labor immigration is removed: fewer people share the existing capital stock and housing, and tighter labor markets raise wages. However, as shown in Figure 3.3, if taxes are raised to restore fiscal sustainability, the effect on private consumption per capita turns negative, even without distortions from taxes on labor supply. The tax burden more than offsets the per-capita gains for private households.